ASOS MODIFICATION NOTE 8 (for Electronics Technicians)
Engineering Division
W/OSO321:BGM

SUBJECT	:	Wind Sensor Assembly Upgrades
PURPOSE	:	To add maintenance capability and operational enhancements for the ASOS wind sensors
EQUIPMENT AFFECTED	:	ASOS
PARTS REQUIRED	:	EPROM P/N 31977 Rev. 2.07 Brass adapters qty. 2 as required Cable, P/N 32335 qty. 1 as required Cable, P/N 32329 qty. 1 as required Molex connector qty. 1 as required Antiseize grease qty. 1 tube Conductive compound qty. 1 tube as required Wind speed transmitter, (MOD 1) qty. 1 Wind direction transmitter, (MOD 1) qty. 1
MOD PROCUREMENT	:	The parts for ASOS Field Modification Kit (FMK) #036 will be provided by the contractor, AAI Systems Management, Inc. FMK #039 will only be provided for those sites that have either a seized adapter and wind direction or speed bottle. All requests for parts must be made through Bob McCormick.
SPECIAL TOOLS REQUIRED	:	None
TIME REQUIRED	:	2 hours
EFFECT ON OTHER INSTRUCTIONS	:	None
CERTIFICATION STATEMENT	:	This modification is authorized by Engineering Change Proposals E93SM05FO70, E93SM05F071, and E93SM05F072. It was successfully tested at seven sites in the Eastern, Southern, and Central Regions and the Test and Evaluation Branch in Sterling, Virginia.

GENERAL

This modification note provides procedures and instruction for two FMKs to upgrade the ASOS wind sensor assembly (copies are attached as Appendix A and B). The first

procedure is to remove the wind processor board from the wind sensor electronics enclosure and replace EPROM U7 (Rev. 2.05) with Rev. 2.07.

This firmware upgrade improves the transfer function for the wind sensor. This procedure also provides vent holes in both crossarm wind sensor adapters. These vent holes will help prevent moisture condensation that contributes to premature bearing failures and excessive torque on the wind sensors. Finally, this procedure replaces current wind speed and wind direction bottles with Modification Note 1 bottles. These bottles include new bearings, shafts, optical chopper, and low temperature grease, which will improve performance.

The second procedure provides wind sensor crossarm brass adapter replacement. The brass adapter will help decrease the probability of the wind speed and direction transmitters from seizing on the crossarm assembly. The second procedure may not be necessary and is to be used **ONLY** if there is a seizure of the wind speed or direction transmitters on the crossarm assembly.

PROCEDURE

Follow installation instructions for FMK #036 and #039 provided by AAI Systems Management, Inc. The Engineering Division will provide FMK #039 to sites with a seizing problem. Call Bobby McCormick (301-713-1835) or Al Wissman (301-713-0261) for a replacement adapter.

Before and After Installation Procedures

Procedures Related to Installation of ASOS Firmware Version 2.07

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194. Inform the person who answers the phone at which site you will be installing new firmware.

2. Get approval of the site MIC/OIC before starting installation. You may install on any day of the month if permission is granted and the restrictions in step 3 are complied with.

3. **Commissioned Sites Only**: Do **not** start installation during bad weather: while precipitation is falling, during instrument flight rule (IFR) conditions, or if either is expected within 3 hours.

AFTER INSTALLING THE FIRMWARE

4. **IF MANUAL BACKUP IS AVAILABLE,** office staff must implement manual full backup observation procedures if installation runs past the regular hourly observation time or if a special must be generated. No special observation is needed when wind system is restarted.

5. Inform office staff that ASOS is again operational.

6. Verify that ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:

   a. Your location,
   b. That installation of the new firmware has been completed, and
   c. That ASOS is operational.

REPORTING MODIFICATION

For commissioned sites, target date for completion of this modification is 30 days after receipt of parts. For other sites, target date for completion of this modification is 120 days after receipt of parts. Report completed modification on WS Form H-28, Engineering Progress Report, according to instructions in EHB-4, part 2, using reporting code ASOS. Make appropriate entries in the SYSLOG using the Maintenance Action Keys, Field Modification Keys and comment fields.

J. Michael St. Clair
Chief, Engineering Division

Attachments

W/OSO321:RRKnibb:rhz:8/19/93:8/24/93:8/26/93
sol:8/27/93:9/7/93:rhz disk HB-11-A
"ASOSMOD8.h11" WP5.1 Speller

SID ___ FMK #036

ASOS FIELD MOD KIT (FMK)
CONTRACT 5O-SANW-1-00050

UPON COMPLETION OF MOD, COMPLETE LOWER SECTION
OF THIS SHEET AND RETURN TO:

AAI SYSTEMS MANAGEMENT INC.
11101 GILROY ROAD
HUNT VALLEY MD. 21030-1108

NOTE: MAKE A COPY FOR ON-SITE RECORDS

Date Prepared: 05/13/93 Task Order/ECP: E93SM05F070, E93SM05F071, and E93SM05F072

Part Numbers Affected: 62828-90113 WIND SENSOR
32321 BELFORT CROSSARM P/N
31952 WIND PROCESSOR BD.

Documentation included:

1. Instructions to drill a .116 dia. vent hole in wind sensor crossarm adapters.

2. Drawing that illustrates location of holes and positioning of drill.

3. Instructions (attachment 1) for installing firmware version 2.07 with illustration.

Description of Change:

* Drill one vent hole in both wind sensor crossarm adapters to prevent condensation. If wire bundle was cut to remove seized wind transmitter(s), refer to FMK 39 installation section.

* Wind speed and direction transmitter change (MOD 1)

* Wind processor firmware upgrade to version 2.07

QA Concurrence with FMK: _____
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Date Modification Complete: _____
Part Removed Serial # _____
Part Installed Serial # _____

Person Completing Modification:_____
Were FMK instructions clear/concise: Y/N (circle)
Was FMK complete (parts,drawings,etc.): Y / N (circle)
If NO, please comment (use back of form if needed):

WIND SENSOR UPGRADE

1. At the DCP, turn the wind circuit breaker to off.

2. Tilt the wind tower to the down position and secure. Cover the lightning rod to prevent accidental impalement.

3. Remove the wind speed sensor from crossarm support. **Note: Cup nut is a left-hand thread**.

4. Remove the wind direction sensor from crossarm support. **Note: Vane nut is a left-hand thread**.

5. With a pencil, make a mark on the crossarm adapter keeping it clear of the connector's OD and in line with the connector's alignment slot. (see drawing top view)

6. Loosen the two bolts securing the adapter into the crossarm. Loosen the two set screws securing the connector adapter and carefully pull the connector out of the adapter, taking care not to damage the wire bundle. Position and tape the connector/wire bundle clear of the pencil marked area.

7. Reassemble the adapter to the crossarm using the pencil mark for orientation.

8. You are going to drill one .116 dia. hole in each crossarm adapter (be sure to use safety glasses).

9. Holding the drill at a 15 to 20 degree angle, drill the hole. (See the figure on page A-5). Penetration of the drill bit should be approximately 0.5".

10. Reassemble connector into crossarm adapter removing all tape and orienting correctly. When properly drilled, hole should be clear of connector's OD and in line with the connector's alignment slot. Reassemble crossarm support using the MOD 1 wind speed and wind direction sensors provided. Apply a very small amount of antiseize grease on the adapter. Do not apply grease near the newly drilled hole. Align the wind direction sensor using either the solar noon alignment procedure or the Davis Pelorus instrument alignment procedure. (These procedures can be found in the ASOS site technical manual paragraph 4.5.2.5.1 and 4.5.2.5.2.) Install firmware version 2.07 at this time per attachment 1. Check for proper operation.

ATTACHMENT 1

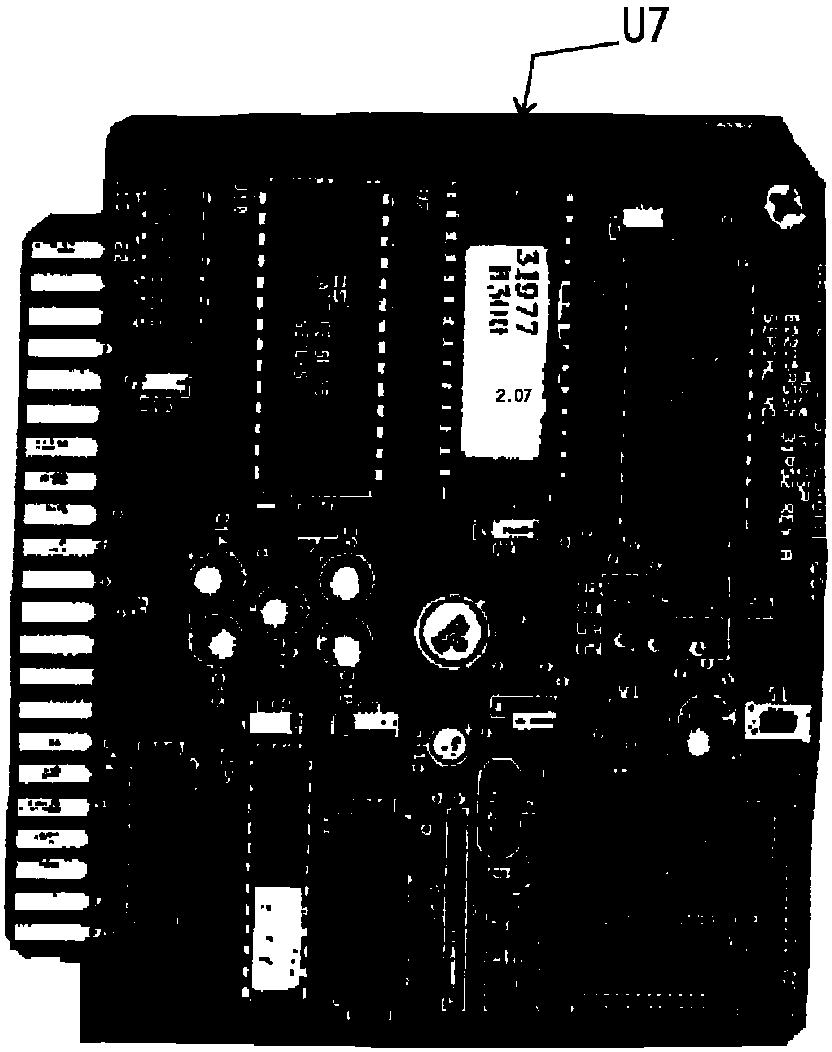
1. Remove hardware mounting the PCB p/n 82205 assy 31952 in the enclosure, then remove the PCB from the connector.

2. Locate U7 (p/n 31977 Rev 2.05) on the PCB and remove from the socket. (Use the PCB drawing supplied.)

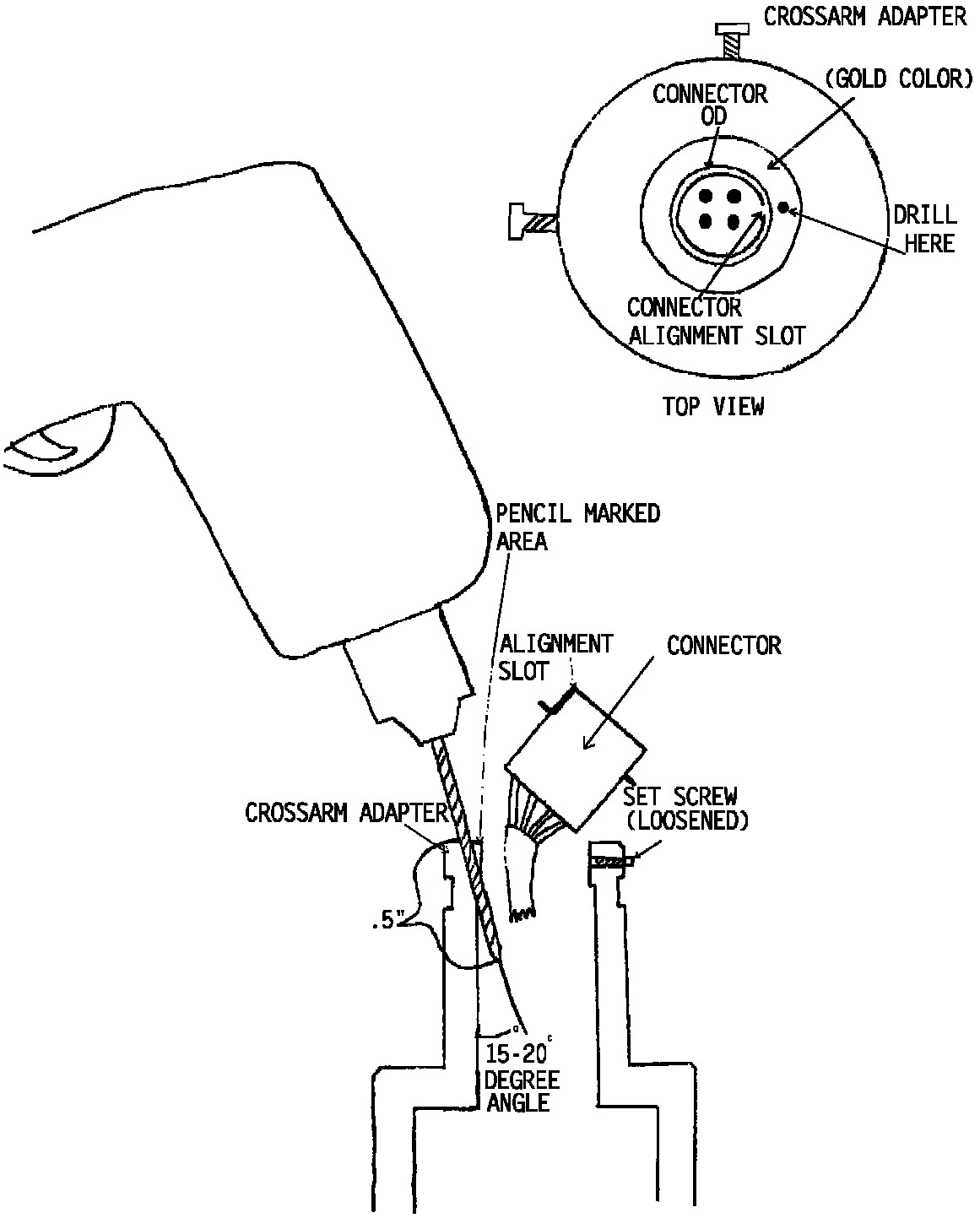
3. Install new EPROM (Rev. 2.07) in socket, observing proper pin 1 orientation.

4. Make sure EPROM legs do not get bent during installation into socket.

5. Re-install the PCB into the connector in the enclosure, making sure it is fully seated in position.



WIND PROCESSOR
BOARD


CROSSARM ADAPTER
(GOLD COLOR)
CONNECTOR OD
DRILL HERE
CONNECTOR ALIGNMENT SLOT
TOP VIEW
PENCIL MARKED AREA
ALIGNMENT SLOT
CONNECTOR
SET SCREW (LOOSENED)
CROSSARM ADAPTER
.5"
15-20° DEGREE ANGLE

SID ___ FMK # 039

ASOS FIELD MOD KIT (FMK)
CONTRACT 5O-SANW-1-00050

UPON COMPLETION OF MOD, COMPLETE LOWER SECTION
OF THIS SHEET AND RETURN TO:

AAI SYSTEMS MANAGEMENT INC.
11101 GILROY ROAD
HUNT VALLEY, ND. 21030-1109

NOTE: MAKE A COPY FOR ON-SITE RECORDS

Date Prepared: 06/16/93 Task Order/ECP: E93SM05F071

Part Numbers Affected: 62828-90113 WIND SENSOR
32321 BELFORT CROSSARM P/N

Documentation Included: Wind sensor crossarm brass adapter replacement instructions.

Description of Change: This FMK provides instructions to install brass adapters on the wind sensor crossarms to prevent seizing of materials.

Parts Included:	Brass adapters	qty. 2	
	Cable	qty. 1	P/N 32335
	Cable	qty. 1	P/N 32329
	Molex connector	qty. 1	
	Antiseize grease	qty. 1 tube	
	Conductive Compound	qty. 1 tube	

QA Concurrence With FMK: _____

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Date Modification Complete: _____

Part Removed Serial # _____

Part Installed Serial # _____

Person Completing Modification: _____

Were FMK instructions clear/concise: Y / N (circle)
Was FMK complete (parts, drawings, etc.) Y / N (circle)
If NO, please comment (Use back of form if needed):

WIND SENSOR CROSSARM ADAPTER (BRASS) REPLACEMENT

Recommend two people complete this modification.

REMOVAL

1. At the DCP, turn the circuit breaker marked WIND to OFF. Remove power to the obstruction lights.

2. Lower tower to the down position and secure. Cover the lightning rod to prevent accidental impalement.

3. Remove the wind speed sensor transmitter and the wind direction sensor transmitter from the crossarm support. **Note: Cup and vane nuts are left-hand threads**.

4. Remove two bolts securing crossarm support to the wind tower. Pull crossarm support from tower taking care while sliding (P3) bracket assembly between the 120 VAC wires for the obstruction lights. Remove bracket assembly, then disconnect connector (J1) of the crossarm support and remove crossarm support from tower.

5. Remove two screws securing condulet cover and gasket and remove condulet cover and gasket from crossarm support.

6. Cut cables 32335 and 32329 located within the condulet outlet body of the crossarm support. At connector J1, pull the now cut section of cable out of the crossarm support. (Do not discard.) Cut the outer shrink tubing from the cable at the J1 end.

7. Loosen two screws securing each crossarm adapter to the crossarm support and remove crossarm adapters, connectors and severed cables from crossarm support.

INSTALLATION

1. Take new cable 32335 and feed (pins first) through the BRASS wind direction crossarm adapter (stamped with alignment line). Secure connector to adapter with two set screws, taking care to line up the slot in the connector with the alignment pin on the adapter. Locate the wind direction sensor side of the crossarm support (stamped with alignment line). Feed the cable through the arm until it exits the condulet outlet body. Pull cable outside of the condulet outlet body and secure crossarm adapter to crossarm support by tightening two screws.

2. Take new cable 32329 and feed (pins first) through the BRASS wind speed crossarm adapter and secure connector adapter with two set screws. Locate the wind speed sensor side of the crossarm support and feed the cable through the arm until it exits the condulet outlet body. Pull cable outside of the condulet outlet body and secure crossarm adapter to crossarm support by tightening two screws.

3. At the condulet outlet body, take the two cables and tie lacing cord over them. Insert the nine pins into the new Molex connector, taking care to insert pins into their proper location. (Use old piece for reference.)

4. At the condulet outlet body, slide the newly formed cable down and out the bottom of the crossarm support.

5. Check P3 connector of cable P/N 32342, S100-2A8MT1W1, (tower signal cable) for corrosion. If connector is corroded replace tower signal cable. Cable may be obtained from Bob McCormick.

6. Apply a small amount of conductive grease in the P3 connector. Connect connector P3 of the tower signal cable (30-ft. cable) to J1 of the crossarm support and install crossarm support in top of tower.

7. Reassemble wind speed and direction transmitters and vane/cups. Apply a small amount of antiseize grease on the adapters. Do not apply grease near the newly drilled hole. Align the wind direction sensor using either the solar noon alignment procedure or the Davis Pelorus Instrument alignment procedure. Check for proper operation.

8. Return Field Mod Kit cover sheet to AAI/SMI.